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(54) Recording and reproducing video data to and from record media

(57) An apparatus and method for recording and reproducing video data to and from a record medium operate to communicate with plural external devices. The apparatus includes plural audio/video data input/output (I/O) devices (10), each of which is programmable and coupled to a respective external device (2) for receiving video data therefrom and transmitting reproduced video data thereto. Each I/O device (10) receives a recording or reproducing external request signal from the associated external device (2), generates a respective recording/reproducing request signal in response thereto, outputs the request signal, receives data reproduced from a record medium during a reproducing operation and supplies the reproduced data to the external device, and receives video data from the external device during a recording operation and supplies the video data for recording on the record medium. A storage control device receives the reproduction and recording request signals and supplies appropriate reproduction and recording control signals in response thereto to the respective I/O device (10) which output the original request signal. The respective I/O device (10) supplies to a storage device appropriate recording/reproduction initiate signals and the storage device either records or reproduces video data to or from the record medium in accordance with the supplied initiate signal, and outputs, during the reproducing operation, the reproduced video data to the respective I/O device (10) which output the reproduction initiate signal.

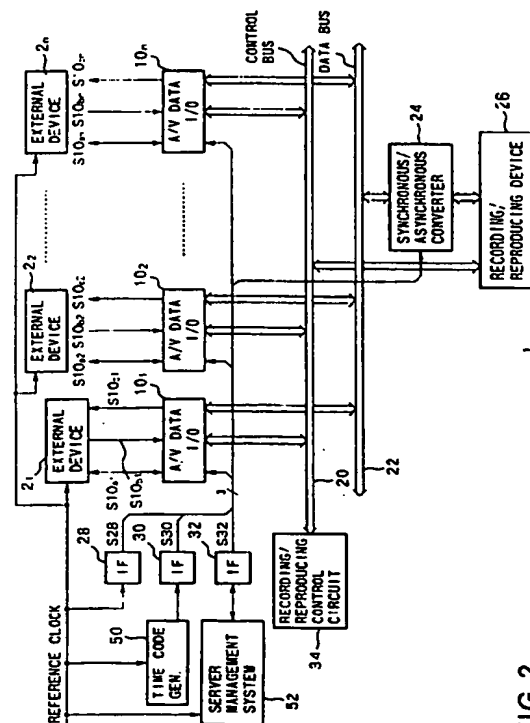


FIG.2

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control bus means for supplying to the reproducing means the reproducing request control signal output from one of the output control means; and

data bus means for supplying the video data reproduced by said reproducing means to the respective output control means which output the reproducing request control signal.

2. The apparatus of claim 1, wherein said external reproduction request identifies a desired video data; and said record medium includes a plurality of addresses in which video data is stored; and said apparatus further comprises means for identifying an address in said record medium at which the desired video data is located; and wherein the respective output control means outputs the reproducing request control signal including the identified address; and said reproducing means is operable to reproduce from the record medium the desired video data from the identified address included in the reproducing request control signal. 10
3. The apparatus of claim 1, wherein said reproducing means is comprised of a plurality of hard drives. 15
4. The apparatus of claim 1, wherein compressed video data is stored in said record medium; and each of said output control means includes means for decompressing the compressed video data reproduced by said reproducing means and outputting the decompressed video data to the respectively coupled external device. 20
5. The apparatus of claim 1, wherein an external device coupled to one of said output control means is a video data editing device, and an external device coupled to another one of said output control means is an on-air type device. 25
6. The apparatus of claim 1, further comprising a server manager system for supplying respective management control signals to each of said output control means in accordance with a predetermined reproduction schedule; and wherein each of said output control means supplies a respective output control signal corresponding to the supplied respective management control signal to the respectively coupled external device. 30
7. The apparatus of claim 1, wherein the reproducing means is an asynchronous type device; said apparatus further comprising converting means for converting asynchronous signals output from said reproducing means to synchronous signals whereby an amount of time between the output of the reproducing request control signal from a respective output control means and receipt of the reproduced 35

video data by the respective output control means is constant.

8. Apparatus for reproducing video data from a record medium, comprising: 5

a plurality of programmed input/output control means each for receiving a respective external request signal from a respective external device, generating a respective reproduction request signal in response to receipt of said respective external request signal and outputting the respective reproduction request signal, and for receiving reproduced data and outputting the received reproduced data to said respective external device;

storage control means for receiving the reproduction request signal and supplying a reproduction control signal in response thereto to the respective programmed input/output control means which output the reproduction request signal, the respective programmed input/output control means supplying in response to the reproduction control signal a reproduction initiate signal; and

storage means including said record medium for reproducing video data from said record medium in accordance with said reproduction initiate signal and outputting the reproduced video data to the respective programmed input/output control means which output the reproduction initiate signal.

9. The apparatus of claim 8, wherein the external request signal identifies a desired video data; said storage control means supplies a reproduction control signal identifying an address in said record medium at which the desired video data is located; the respective programmed input/output control means supplies a reproduction initiate signal including the identified address to the storage means; and the storage means is operable to reproduce from the record medium the desired video data from the identified address included in the reproduction initiate signal. 40
10. The apparatus of claim 8, wherein the respective programmed input/output control means supplies a reproduction permit signal to the respective external device in response to the reproduction control signal supplied by the storage control means, and supplies said reproduction initiate signal to said storage means after receipt of a reproduce command signal from the respective external device. 45
11. Apparatus for recording video data onto a record medium, comprising: 50

a plurality of input control means, each including programmed control means for outputting a respective recording request control signal in response to receipt of an external recording request supplied by a respective external device coupled to the respective input control means, and for receiving video data from said respective external device;

recording means for recording supplied video data onto a record medium in accordance with the recording request control signal;

control bus means for supplying to the recording means the recording request control signal output from one of the input control means; and data bus means for supplying the video data received by said one of the input control means to the recording means.

12. The apparatus of claim 11, wherein said record medium includes a plurality of addresses; and said apparatus further comprises means for identifying an address in said record medium at which the received video data is to be stored; and wherein the respective input control means outputs the recording request control signal including the identified address; and said recording means is operable to record on the record medium the supplied video data at the identified address included in the recording request control signal.

13. The apparatus of claim 11, wherein said recording means is comprised of a plurality of hard drives.

14. The apparatus of claim 11, wherein each of said input control means includes means for compressing video data supplied by the respectively coupled external device.

15. The apparatus of claim 11, wherein an external device coupled to one of said output control means is one of a video data editing device, video tape recorder and a camera.

16. The apparatus of claim 11, further comprising converting means for converting said video data supplied by each of said external devices to SCSI-type signals prior to being recorded on the record medium by the recording means.

17. Apparatus for recording video data onto a record medium, comprising:

a plurality of programmed input/output control means each for receiving a respective external request signal from a respective external device, generating a respective recording request signal in response to receipt of said respective external request signal and outputting the re-

spective recording request signal, and for receiving video data from said respective external device and outputting the received video data; storage control means for receiving the recording request signal and supplying a recording permit signal in response thereto to the respective programmed input/output control means which output the recording request signal, the respective programmed input/output control means supplying in response to the recording permit signal the received video data; and storage means for recording the video data output by a respective one of said programmed input/output control means on said record medium.

18. The apparatus of claim 17, wherein said storage control means supplies a recording permit signal identifying an address in said record medium at which video data is to be recorded in response to receiving the recording request signal; the respective programmed input/output control means supplies a recording initiate signal including the identified address to the storage means; and the storage means is operable to record on the record medium the video data output from the respective programmed input/output control means at the identified address included in the recording initiate signal.

19. The apparatus of claim 18, wherein said storage control means is operable to supply a recording region request signal to said storage means in response to receiving the recording request signal; said storage means supplies a recording region identification signal to said storage control means identifying an address in said record medium at which said video data is to be recorded; and said storage control means supplies to the respective programmed input/output control means said recording permit signal including said address identified in said recording region identification signal.

20. The apparatus of claim 17, wherein the respective programmed input/output control means supplies a recording allowance signal to the respective external device in response to the recording permit signal supplied by the storage control means, and receives the video data from the respective external device in response to the supply of the recording allowance signal.

21. The apparatus of claim 17, wherein each of the programmed input/output control means includes means for adding time codes to the video data received from the respective external device when the received video data does not include time codes.

22. The apparatus of claim 17, further comprising

means for synchronizing each of the programmed input/output control means.

23. Method of reproducing video data from a record medium, comprising the steps of:

receiving by one of a plurality of output control devices an external reproduction request supplied by an external device;
outputting by the output control device which received the external reproduction request a reproducing request control signal;
supplying the reproducing request control signal to a reproducing device;
reproducing in the reproducing device video data from a record medium in accordance with the reproducing request control signal;
supplying the reproduced video data to the output control device which supplied the reproducing request control signal; and
supplying the reproduced video data from the output control device to the external device.

24. The method of claim 23, wherein the external reproduction request identifies a desired video data; and said method further comprises the step of identifying an address in the record medium at which the desired video data is located; and wherein the reproducing request control signal includes the identified address; and said reproducing step is carried out by reproducing from the record medium the desired video data from the identified address included in the reproducing request control signal.

25. The method of claim 23, wherein compressed video data is stored in said record medium; and the method further comprises the step of decompressing compressed video data supplied to the output control device to produce uncompressed video data.

26. The method of claim 23, further comprising the steps of supplying respective management control signals representing a predetermined reproduction schedule to each of the output control means; and supplying from each output control means respective output control signals corresponding to the supplied respective management control signal to respectively coupled external devices.

27. The method of claim 23, further comprising the step of converting signals output from the reproducing device to synchronous signals whereby an amount of time between the output of the reproducing request control signal and the supply of the reproduced video data to the output device is constant.

28. Method of recording video data onto a record medium, comprising the steps of:

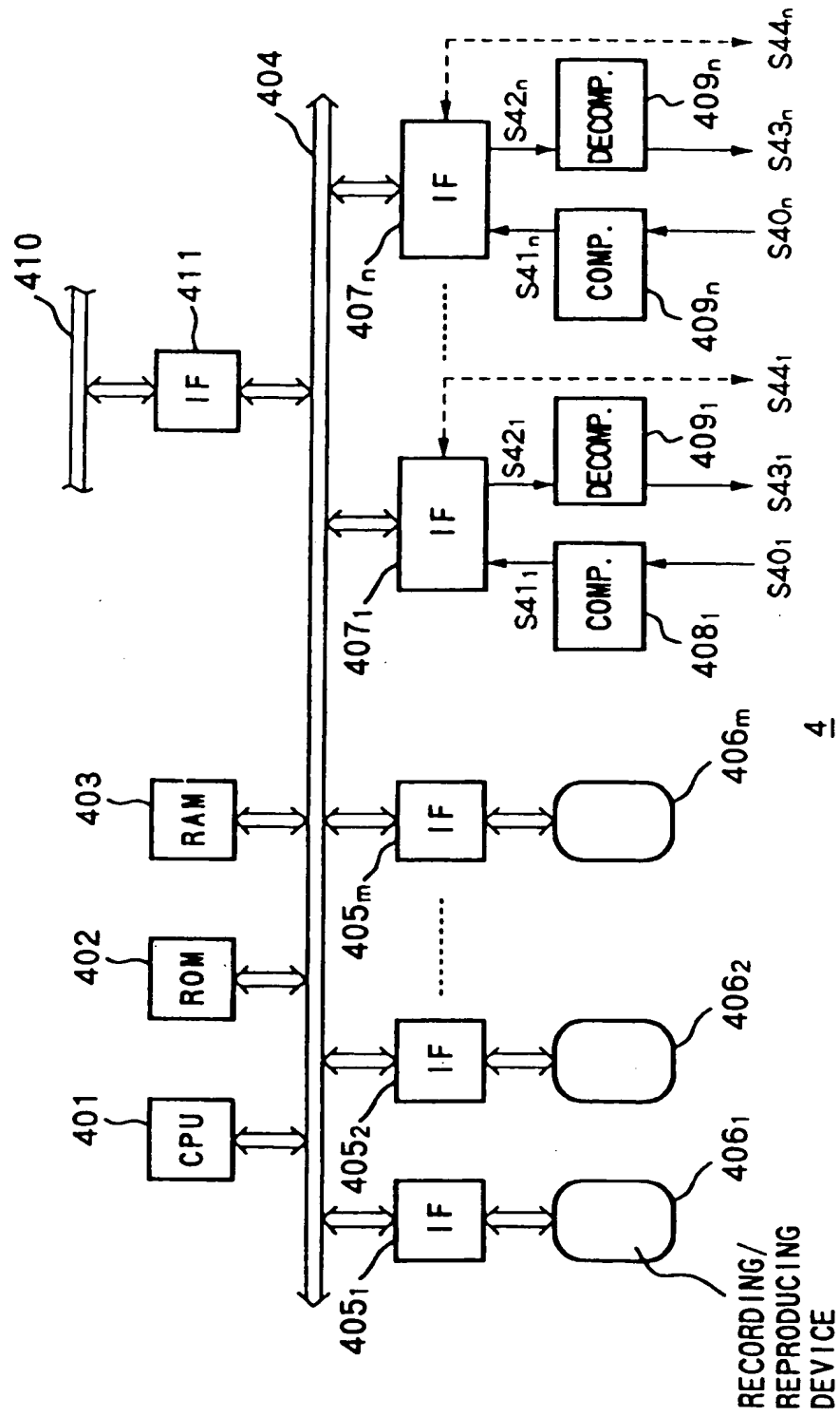
receiving by one of a plurality of input control devices an external recording request supplied by an external device;
outputting by the input control device which received the external reproduction request a recording request control signal;
receiving, by the input control device which received the external recording request, video data from the external device;
outputting by the input control device the received video data;
supplying to a recording device the output recording request control signal over a control bus;
supplying to the recording device the output video data over a data bus; and
recording in the recording device the video data supplied over the data bus onto a record medium in accordance with the recording request control signal supplied over the control bus.

29. The method of claim 28, further comprising the steps of identifying an address in the record medium at which the received video data is to be stored; and wherein the output recording request control signal includes the identified address; and said recording step is carried out by recording on the record medium the supplied video data at the identified address included in the recording request control signal.

30. The method of claim 28, further comprising the step of compressing the received video data to produce compressed video data; and wherein the step of recording is carried out by recording the compressed video data on the record medium.

31. The method of claim 28, further comprising the step of converting the received video data to an SCSI-type signal; and wherein the step of recording is carried out by recording the SCSI-type signal on the record medium.

FIG. 1



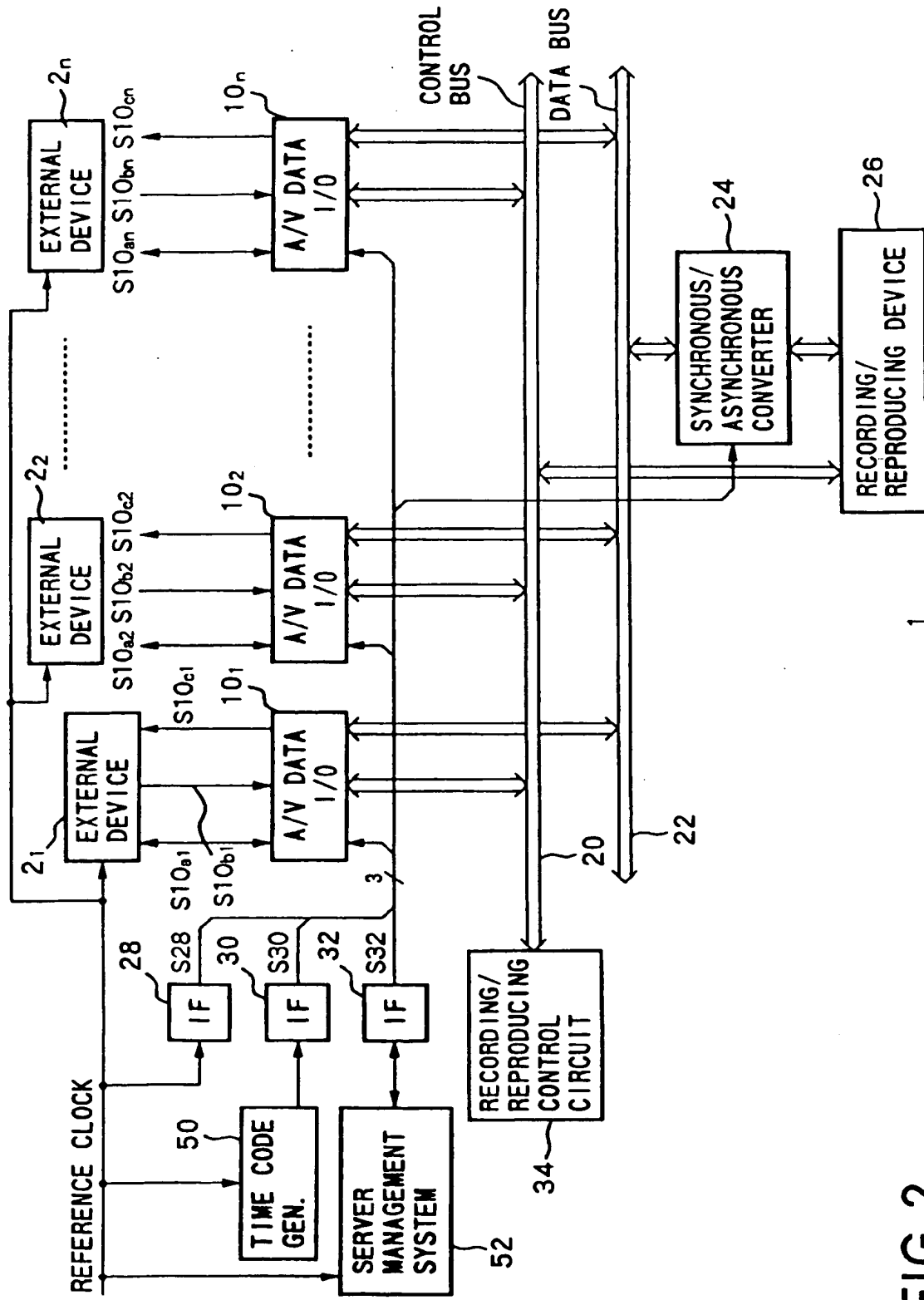
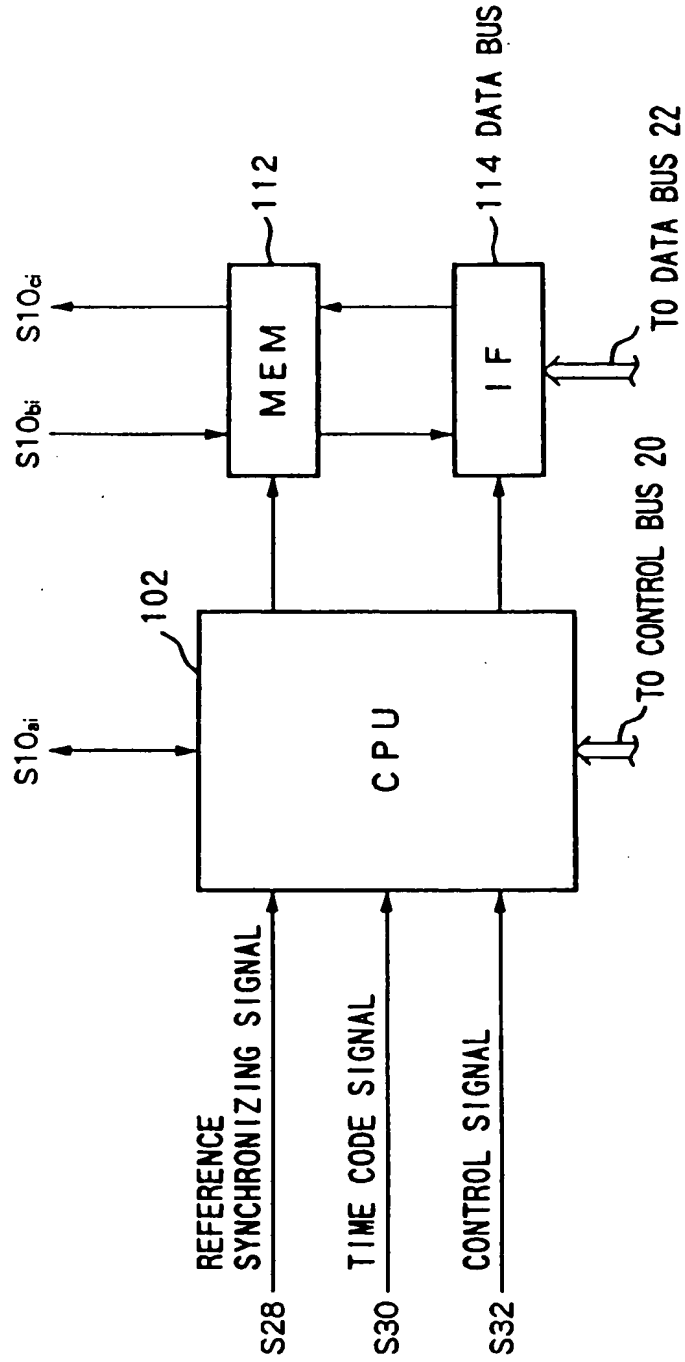


FIG.2

FIG.3



10.

FIG.4

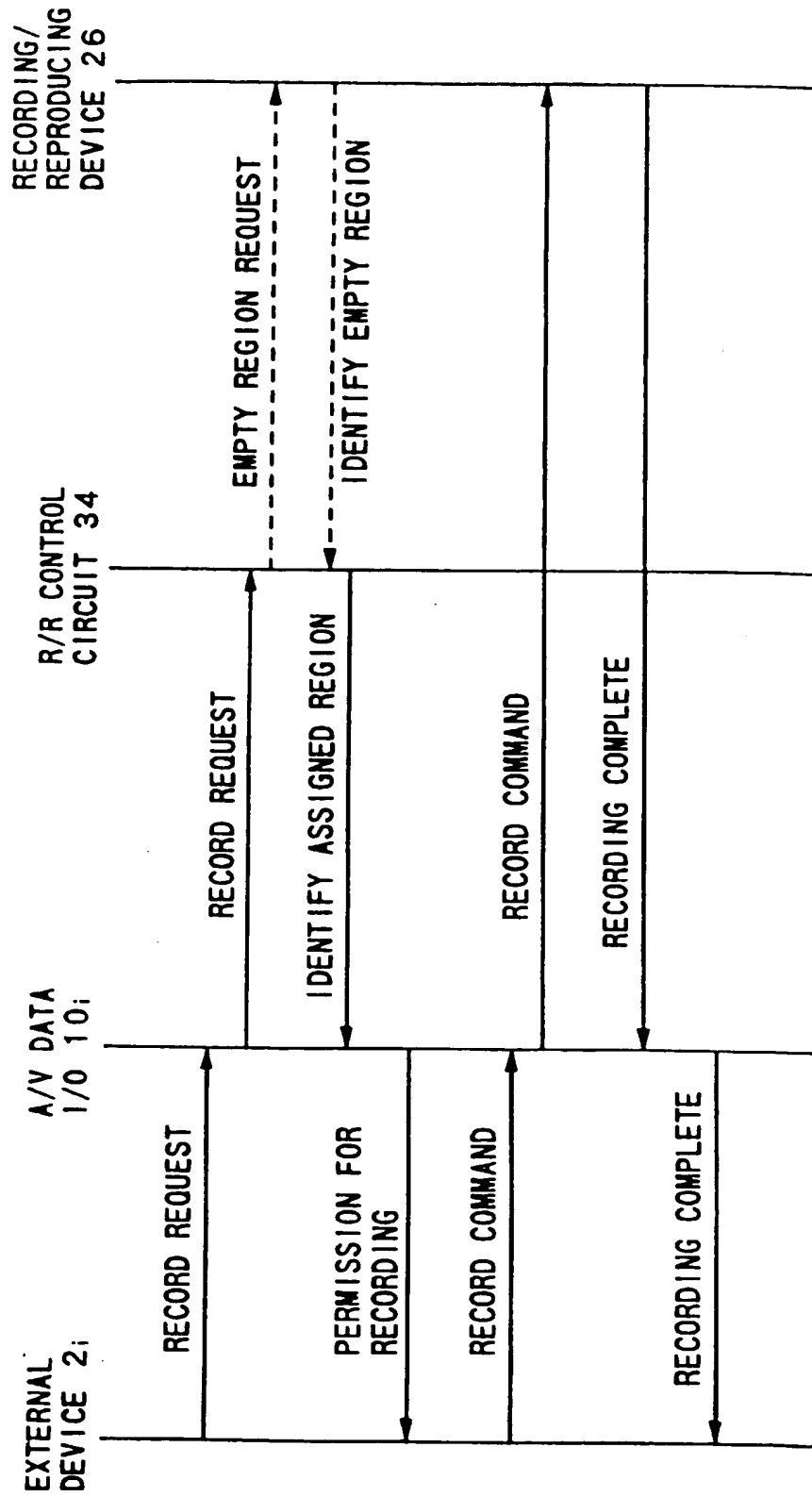


FIG.5

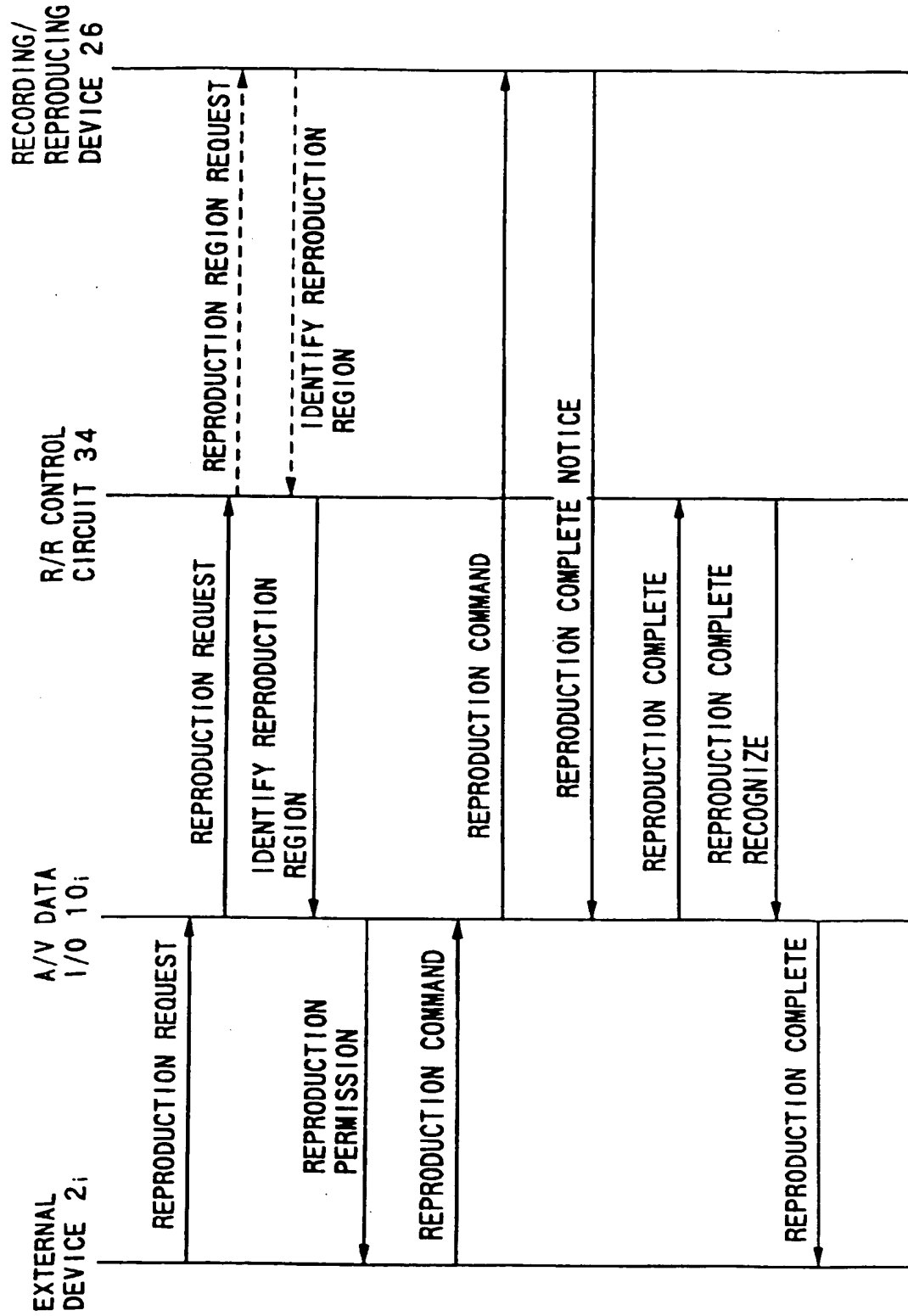
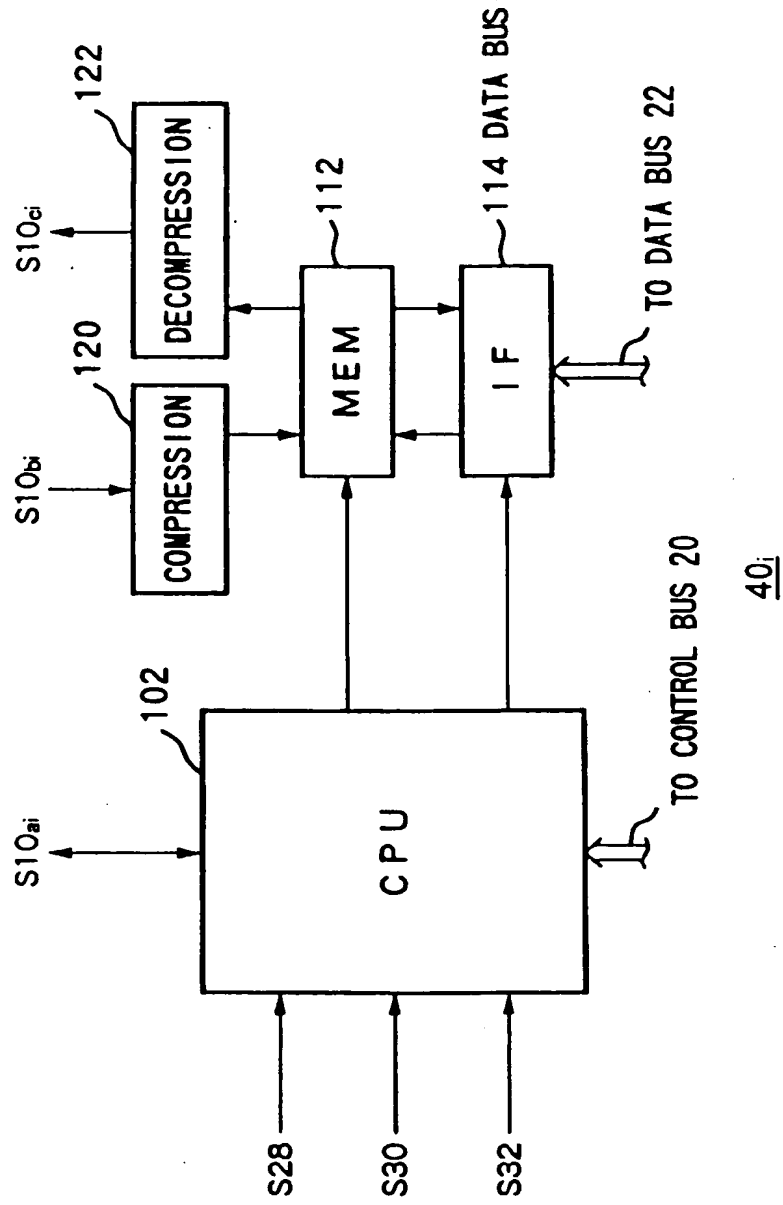
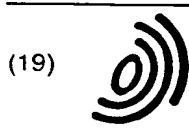


FIG. 6





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receives video data from the external device during a recording operation and supplies the video data for recording on the record medium. A storage control device receives the reproduction and recording request signals and supplies appropriate reproduction and recording control signals in response thereto to the respective I/O device (10) which output the original request signal. The respective I/O device (10) supplies to a storage device appropriate recording/reproduction initiate signals and the storage device either records or reproduces video data to or from the record medium in accordance with the supplied initiate signal, and outputs, during the reproducing operation, the reproduced video data to the respective I/O device (10) which output the reproduction initiate signal.

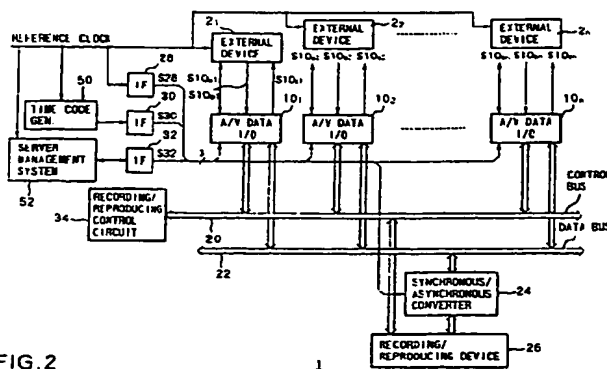


FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 6439

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A	* figures 1,2 *	10,19,20	
X	US 5 440 336 A (RADOWICK ERNEST W ET AL) 8 August 1995 (1995-08-08) * abstract * * column 1, line 67 - column 2, line 34 * * column 3, line 4 - column 4, line 57 * * column 5, line 13 - column 6, line 12 * * column 10, line 4 - line 19 * * column 18, line 24 - line 34 *	1-4,6,8,9	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H04N
Y	* figures 1,28 *	5,11-18,21-31	
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A	* figures 1,2,3,4A *	1,8,10,19,20	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21 December 2000	Examiner Fantini, F
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	21 December 2000	Fantini, F	
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